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UTILITY MANAGEMENT NOW**

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IS TWICE AS IMPORTANT**

**COMMUNITY SOLAR:
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ENERGY SUMMIT **2022**
SPECIAL EDITION

Sustainability Is Essential

Journal of **Utility** management

Message From the Publisher

I always think of the word Essential as anything it describes is a "must have." Like having a pair of black shoes.... they just go with everything. What is "must have" in multifamily? Granite counter tops? Pool and fitness center? Pet relief stations? Has sustainability always been essential, we have haven't been ready to embrace it? Here is a fun contrast: in the 1970's essentials in multifamily were a decked-out kitchen and carpet. While in sustainability, in 1970 the EPA was created by Richard Nixon. Admittedly the first action the EPA worked on was marine toilets and keeping raw sewage out of the water) but ultimately created the Clean Water and Clean Air acts. The EPA had a goal in 1970 to reduce auto emissions (CO_2) by 90% by 1975. Reduce Emissions being Essential? Are we still talking about the past and not the present?

I am excited so share that sustainability has become essential for multifamily. When we look at sustainability, we see it as important to our business from multiple stake holders. Let's look to the money. Sure, we can talk about how the mega trend of ESG is changing our business as investors require a renewed focusing on committing to reducing our footprint and/or the amount of resources our properties consume. This perspective is critical because if our investors require it, we do it. Essential. Continuing to look at the money, more and more owners are seeing the positive NOI of sustainability.

I doubt that anyone reading this has never changed an incandescent light bulb to an LED and reduced their expense. Lastly, looking to the financial benefits of sustainability, we see more

and more residents viewing efficiency (sustainability) in their units and the communities that they chose to live in as being a priority resident demand for sustainability adds to its essentialism in multifamily.

I am excited to present this issue of JOUM to you as we deep dive into the "must haves" of our sustainability. Let's explore certifications and renewable energy and ESG reporting, your newest essentials of sustainability.

Mary Nitschke
Publisher

Message From the Guest Editor

An old saying has become more meaningful lately: "May you live in interesting times." I think the last few years certainly qualify.

The pace of change has picked up. Trends have accelerated to change how we work, shop and even eat. The discipline of utility management is no exception. Changes that were building slowly before have recently accelerated to become "business as usual."

The good news is that the changes in managing and tracking utilities have been largely positive. It's now easier to do our jobs remotely, and quickly advancing technologies now make it easier to identify leverage points to improve property performance.

While new tech steals all the headlines and glory, one of the many things that I'm personally grateful for during these past few years is the connection

with my colleagues in the Utility Management Advisory (UMA). The board members named on the masthead opposite this page are some of the most knowledgeable and collaborative professionals I've had the pleasure to work with in my career.

Having this group to bounce ideas off of and discuss the changes in our industry has been invaluable in tracking the evolution of utility management, especially since travel to in-person conferences is so limited. I want to provide a gentle reminder that this group is available to everyone reading this issue – each of you can access this valuable resource by visiting UMAdvisory.org.

While I hope we'll all be gathering again soon at Apartmentalize, OPTECH or any of the other great live conferences, those interested in utility management will find

the UMA's live Town Halls and blog posts a great complement to stay connected and current.

Through all the challenges of the last 18-24 months, the apartment industry has emerged stronger and more energy-efficient, building on a foundation that's more prepared for the future than ever before.

I'm excitedly looking forward to the next chapter, but I'll be perfectly okay if it's a little less "interesting."

Tim Haddon
Director of Strategic
Business Services
PK Management and
Journal Guest Editor

Five Trends Impacting Utility Management Now

As 2022 gathers momentum, five important trends have emerged that are changing how we are executing, improving and finding value in utility management for rental housing.

Owners, operators and investors across the country are watching the increasingly complex utility market and shifting industry factors to identify new opportunities and update their strategies for improving NOI, meeting sustainability goals and creating lasting value.

Flexibility is a superpower now: Rental housing is responding to ongoing changes in the landscape of a strengthening economy, hybrid work environments and evolving renter demands – and facing challenges in operator cost control, energy resource gaps, climate-positive pressures and investor expectations.

We focus here on the trends that will drive the innovations, tools and processes we rely on and the impact that policy, partnerships and compliance may have on multifamily utility management operations and portfolio performance. While many of these trends began before 2020, in 2022 they are becoming widely adopted and employed.

Let's explore the 5 trends that will help you identify the opportunities for managing expense, risk, and recovery – and gain the competitive edge to deliver peak property performance, more sustainable operations and more robust portfolio value.

Automation

The first trend we will examine is automation. This has been an evolving trend since the days of the industrial revolution and Henry Ford's production line. But 2020 changed its *purpose*. For years, automation was a backend tool we could lean on to save time and increase revenue. Then when many of us were forced to leave our workplaces overnight, automation became a front-end tool we *needed* to do our jobs and support customers remotely.

An example specifically related to utility management illustrates how automation can aid our ability to work remotely, if needed, or simply make a process more efficient. When 2020 began, some property management companies had already automated payment of their utility bills.

They still controlled when the bills were paid, but they could manage approvals and schedule payments with a click on a computer screen or even a mobile device. For those not yet equipped with utility payment automation, the bills stacked up in mailboxes and on desks, waiting for signatures and someone to post and mail them — putting utility payments at risk for late fees and other penalties.

More than two years later, smart portfolio managers have uncovered all kinds of ways to automate routine and administrative tasks, which not only creates efficiency but also safeguards business processes by allowing management to oversee and initiate many tasks remotely.

Smart Tech

Another trend changing utility management is the broadening adoption and capabilities of smart technology. Like automation, this trend has been around awhile, but its utilization exploded after 2020. Connected tools like smart thermostats to manage energy consumption, smart locks to allow maintenance to enter empty apartments, and leak detection devices to alert off-site management to on-site issues became widely available in new and even existing developments to support remote access, control and management for increasingly stretched property operations and tech-savvy renters. This trend was fueled by the rapid adoption of mobile technology, Wi-Fi accessibility and economies of scale in smart tech production.

Data & Benchmarking

Another evolving trend in rental real estate is data collection and benchmarking. In the past few years, the purpose of data collection and benchmarking has changed dramatically. This was once an area reserved for data "geeks" searching for energy usage anomalies and compliance teams needing numbers to fulfill mandatory benchmarking requirements. Now, data and benchmarking has become a driving force across property operations and asset optimization as management has realized that the real-time monitoring, measurement and reporting available makes this the holy grail of portfolio performance improvement.

ESG

Which leads right into the next trend: Environmental, Social and Governance (ESG). These are company policies reflecting socially conscious and climate-positive standards for a company's operations. Investors are now looking to these standards to screen potential investments for risk and reward. Environmental criteria consider how a company performs as a responsible steward of the natural ecosystem. Social criteria examine how it manages relationships with employees, vendors, customers, and communities. Governance covers a company's leadership practices, pay structures, audits, policies, and shareholder rights.

For the purposes of this article, we will focus on the "E" of ESG, specifically the smart usage of energy and its byproducts. Given that management and investors are now tracking properties' usage and disposal of energy byproducts, ESG could not have emerged as a trend without the strong momentum of the data and benchmarking trend. In other words, data powers ESG.

Collaboration

It is difficult to gain and maintain expertise in all of these trends while performing daily job tasks. That's why our final trend emerged — collaboration. While business was once a discipline of competition and gains were guarded with secrecy, the events of the last few years forced us to reach out to our coworkers, vendors and even colleagues working at other companies for help.

The winners of the last few years have been the organizations willing to learn best practices and share their own successes and failures. That's really what ESG is encouraging, sharing what's working (and what isn't) for the benefit of all.

While it's good to see ESG reports, what may be more important is how we execute on the projects that produce the results. Here we can look to industry trade shows to learn the latest information, but what do you do between trade shows? Industry peer groups like the Utility Management Advisory (UMA) can fill the void. The UMA members post blogs on timely topics to the website, host quarterly town halls to share ideas, and speak frequently at industry training events and conferences. More importantly members call on each other to share feedback on their utility management challenges via UMAdvisory.org.

And another often-overlooked area of collaboration is your vendors. Vendors have deep knowledge on specific disciplines and are often incentivized to make sure you're successful. At minimum, they want to keep you as a customer. Lean on them to help you optimize performance.

Being aware of these five trends will empower you to stay ahead of the curve with renters, get that winning edge in the market, and optimize your performance for specific results. Once thing is certain, the pace of change is picking up, and those that embrace change will reap the benefits.

By JOUM Staff

Building Benchmarking is Twice as Important in 2022

If the past two years of COVID-19 have taught us anything, it's that the built spaces where we live, work and enjoy are extremely important.

Besides reliable internet, healthy and more "green" spaces lead the demand curve as top multifamily and commercial renter preferences for 2022. But how do residents, investors, staff and other stakeholders confidently uncover which properties rank the greenest?

That's where whole building benchmarking – a standardized, trustworthy approach to measure the energy and water (and increasingly waste) usage of a building and compare its performance over time to like-types of buildings – comes in. There is plenty that's new in 2022 for mandatory building benchmarking, not to mention escalating voluntary reporting that requires accurate benchmark data.

Before jumping into new mandates, let's start with a bit of history.

15 Years of EPA ESPM Benchmarks (and Counting)

For over 15 years, the EPA has offered its ENERGY STAR® Portfolio Manager® (ESPM) building benchmarking tool for free. More than 275,000 commercial and multifamily properties use ESPM to track their energy, water, waste and materials. Since launching in 2007, ESPM has standardized building benchmarking nationwide:

- All federal buildings report energy use and disclose publicly

- 12 U.S. states today mandate state buildings benchmark

- Over 50 voluntary programs leverage ENERGY STAR tools (GRESB, LEED, etc.)

- 275,000+ buildings (25% of all commercial buildings across the US) have been benchmarked in ESPM

- In 2022, 3 U.S. states mandate benchmarking for commercial and multifamily buildings

- 40+ other local mandates have emerged (more on these later in this article

Across the U.S., we're monitoring many other local government agencies that are also debating mandatory building benchmarking in the future. According to the EPA, the ultimate goal for property benchmarking, whether for government and finance-related mandate or voluntary reporting, is to tackle the climate crisis through deep energy efficiency and decarbonization of buildings, which today comprise over 30% of US GHG emissions.

Compliance Mandates vs. Elective Reporting

There are typically two types of building benchmarking requirements: compliance mandates and elective reporting.

Compliance mandates come in a variety of types. First are those for building benchmarking codified in federal, state or local laws, thus incorporating detailed and specific requirements. Second are compliance mandates that qualify your properties for financing, such as HUD Green Loans, Fannie Mae Green Financing Incentives and Freddie Mac Green Advantage Incentives.

A third type of mandated benchmarking is required for property taxes and tax incentives or other financial regulations. For investors, we anticipate more benchmarking to comply with Federal Trade Commission investor regulations to standardize environmental, social and governance or ESG reporting in 2022.

Elective reporting, on the other hand, is voluntary. Building benchmarks are used for portfolio-wide, multifamily real estate business operations and investing. The leading elective reporting platform is GRESB, which continues to break records for organizations reporting their real estate performance to be scored and ranked by GRESB. Other elective benchmarking and reporting requirements are used to qualify for the Better Buildings Challenge, achieve LEED ratings for buildings, and even generate quarterly reporting for completely internal yet portfolio-wide building performance comparisons.

Building Benchmarking Scores Are Valuable (and Visible)

Whether a compliance mandate or elective, building benchmarking is seen as increasingly important to multifamily asset optimization. The key is that ESPM benchmarks come with a score.

Based on utility efficiency and other factors, benchmarked buildings receive an ENERGY STAR score between 1-100. The higher the score, the better the asset's performance.

Buildings that score higher than 75, for example, can qualify as "energy-efficient homes," which also qualifies building owners for federal income tax credits and deductions, along with saving billions in energy and water utility costs every year.

Scores are also becoming far more visible.

Take the New York City Benchmarking Law. NYC's benchmarking compliance mandate requires owners of buildings with over 25K square feet to submit their energy and water consumption data via ESPM annually on May 1. The ENERGY STAR score is translated into a Building Energy Efficiency letter grade: A for buildings with benchmark scores of 85 or higher down to F for those that didn't submit. The kicker is that the grades are publicized and must be prominently displayed with an energy label near all public entrances for that building.

More Carrots: Leveraging Benchmarking to Earn ENERGY STAR Certification

Like a badge of honor, an ENERGY STAR certification is awarded to buildings that score at least 75.

As more scores are made public on local governmental websites or posted on buildings themselves, scores and Certifications will matter more to residents and investors alike. In fact, municipalities like Orlando make it easy to search scores for all compliance-mandated buildings.

While it's very rare to rate a perfect 100, we've found that many situations involve incorrect data on property size or equipment that cause inaccurate scores.

In the past, this wasn't so important. But as more jurisdictions are now enforcing benchmark mandates and penalties, including municipal auditors cross-referencing ESPM inputs on square footage and more against tax records, the accuracy of data potentially impacts costs, too.

More cticks: Benchmarking Penalties, Tax Record Audits and Retro-Commissioning

Of the nearly 45 US state and local mandates we're tracking right now, the majority also include penalties for inaction that vary greatly in the amounts and types of penalties levied.

For example, penalties for noncompliance with local benchmarking mandates range from annual fees of up to $5000 per building to daily penalties of $100 or more!

In addition, low-performing buildings — those with ENERGY STAR scores at or below 50 – are put on improvement plans. Audits and retro-commissioning, which uses a systematic procedure delivered by certified engineers to make immediate improvements and recommend investments that will increase a building's energy efficiency.

Mandates Requiring Building Audits

About one-third of state and local benchmarking mandates require building audits, at the beginning of the benchmark and/or throughout the building's operations. Regular schedules are typically every 5 years with a handful at 10.

The exception is when a building scores less than 50. These low-performing buildings require audits at the time of the low scores. The most common type is an ASHRAE Level 1 audit.

Why Your Building May Be Exempt From Audits

There is a wide variety of reasons that your property may be exempt from audits.

Whether mandated or voluntary, benchmarking your buildings is proven to deliver better NOI because you know how well that building performs.

Working with a reputable vendor is highly valuable if they track all of the changing mandates so you're not penalized, know the value-add benefits of incentives that require building benchmarking, and serve a customer base you can compare to your own properties.

What's New for Business Benchmarking in 2022

We're tracking nearly 40 cities and counties and 3 states that have mandatory building benchmarking on their books for 2022. Major additions or changes you need to be aware of include:

1) State of Colorado now mandates benchmarks submitted by December 1, 2022, and annually thereafter for multifamily and commercial buildings of 50,000 or more sqft.

2) Ann Arbor, Michigan, now requires benchmarking by June 1 for buildings with 100,000+ sqft, 50,000+ in 2023, and 20,000+ in 2024.

3) Chula Vista, California, now requires benchmarks for 50,000+ sqft, dropping to 20,000 sqft by 2026.

4) Other changes across the US — from Washington, D.C. to Boston, Massachusetts to Reno, Nevada — range from increased penalties and updated building qualifications to and new audit and retro-commissioning requirements.

If you're the competitive sort, you know that stats are crucial to a good game strategy. Building benchmarking — whether to meet mandates or voluntarily report to improve investor confidence — is a valuable resource.

Keep up with business benchmarking changes online: https://www.realpage.com/utility-benchmark/

Measuring the RealPage Impact in Building Benchmarking

In 2021, RealPage benchmarked nearly 2,100 different properties and achieved 100% compliance for our benchmarking SaaS customers. We also set up 300+ buildings implementing for WasteWise, the newest measurement for ENERGY STAR Portfolio Manager, helping to eliminate 14,000 metric tons of CO_2e through recycling and other waste diversion. Through our Energy and Water Conservation or ECO Services, we've also helped reduce multifamily consumption of 18,850 gallons of water, 5,163 MWh of electricity and 85,000 therms of gas. Our growing Procurement of wind and solar, including community solar in select markets, has also eliminated 12,400 metric tons of CO_2e, the equivalent of carbon sequestered by 15,195 acres of forest annually.

Building benchmarking is big in multifamily — and growing bigger

Lowering consumption of energy and water is highly desired by apartment residents, both for the utility cost savings and for the environmental benefits. Shifting to solar or wind-generated energy, offering EV charging, and supporting composting and recycling are building services also growing on the renter popularity curve.

These community conservation measures also contribute to healthy spaces. Renters, staff and investors alike are seeking buildings with proper filtration, fresh air flow and low VOCs (volatile organic compounds and gases that negatively impact health and wellness).

Whether mandated or voluntary, building benchmarking is becoming an increasingly useful tool for evaluating multifamily real estate investments, boosting operational efficiency and attracting residents.

Author Carol Schmitt

Community Solar: No Capital Required for Green Electrons

By any measure, the shift to clean energy has been remarkable.

The rapid expansion of energy generated by wind and solar means that 20% of the U.S. electric grid is now powered by renewables, with some electric grid segments approaching 40%.

As the shift to decarbonize electricity accelerates, more alternatives in accessing "green electrons" are growing, as well. For rental residents, this is particularly important.

Multifamily housing presents several challenges for on-site renewable generation. Apartments, townhomes and condos often do not have the right or enough roof space to install their own solar. Other roadblocks — capital investment, dealing with complexities of permits, growing interconnection queues, supply chain challenges and disruptions ⎯ make on-site solar a lot to navigate.

For those seeking to lower their greenhouse gas emissions and negative impacts on our climate (and save some money while you're at it), there is an alternative: community solar.

What is community solar?

Community solar is a solar project or purchasing program, within a geographic area, in which the benefits of a solar project flow to multiple customers, such as individuals, businesses, nonprofits, and other groups. There are typically two community solar purchasing models: indirect and direct.

Often referred to as "solar farms," indirect community solar is most frequently an off-site photovoltaic (PV) array. Residents lease the energy generated by the farm's solar panels. Signup is voluntary but not available everywhere, either restricted by local government regulation or by supply too limited to meet the demand.

Direct community solar indicates direct investment, as well as potential on-site generation. These community solar installations can be larger PV arrays financed by a local group, such as an HOA. The issue of who takes on the capital investment to build and maintain the solar project is spread across a group of investors that directly use the green electrons.

Community solar helps reduce GHG emissions

GRESB is a recognized global leader in delivering, scoring, validating and reporting commercial real estate data to the capital markets. According to GRESB, residents who sign up for community solar help their properties lower their Scope 3 emissions, which is increasingly important to reach ESG goals. If a property installs solar on-site, they lower their indirect emissions from the grid, characterized as Scope 2.

Residents save money on their electric bills

"Renters often look to community solar to lower their carbon footprint but are often surprised these agreements save them money too," says Dimitris Kapsis, VP Energy and Sustainability Services at RealPage. The most effective community solar offerings for multifamily provide a mobile app for residents, said Kapsis. The app engages residents by illustrating savings as well as the billing provided by the electric utility.

Kapsis adds that savings vary based on seasons, equipment on a property, and location. If a property uses gas for water and space heating in winter, savings will seem low during cold seasons. During the summer, however, when air conditioning and other cooling are used, savings will be greater.

Fast: No permitting, interconnection, supply chain or other buildout woes

The COVID-era supply chain woes have impacted equipment for solar installations, a situation being remedied with more solar plants opening in North America. Interconnection, the process of connecting a solar power installation to the electric grid, has increased queues based on more solar, wind, electric vehicle chargers and energy storage (batteries for buildings).

Easy: Benefits of solar at the click of a signup form

When and where available, signing up for community solar is typically as easy as choosing a rate structure with a local utility. The trick is living in or owning/operating rental real estate within a jurisdiction favorable to community solar. For example, Colorado currently has one of the most favorable U.S. markets for both access and pricing of community solar electricity. Other favorable locations include the Washington, D.C. metro area and Maine.

Community-driven savings starts now

One more thing to know about solar: These opportunities are very popular and get subscribed to quickly. Sign up now to start cutting emissions and saving money sooner.

Author Carol Schmitt

Does Submeter Performance Really Matter?

The other day I ran across an article on the question of whether product performance really mattered — and whether that performance was critically important to the health of the submeter installation. It actually got me thinking more about submeters and the important surrounding factors that impact product performance in the submeter industry.

Because. I evaluate submeter products and solutions every day in my role preparing proposals RFPs for new construction, I came up with a number of circumstances that influence performance:

- **New construction architecture is not wireless-friendly.** After installing hundreds of submeter applications, designing submeter RF solutions for clients and resolving installation issues, I have concluded that submeter is an afterthought when it comes to building architectural design. The push to install repeaters in IDF rooms, electric closets and almost everywhere except where it should have been installed in the first place greatly hinders 100%-coverage submeter goals.

- **General contractor and project management budget planning.** The emphasis on the least expensive solution instead of the optimal and most fitting application based on the property layout greatly hinders proper submeter installations. The type of Automated Meter Reading (AMR) solution employed is sometimes determined more by budgetary constraints of the client than by the property layout. The focus on "cost-per-door" and not on a best solution philosophy greatly hinders correct equipment selection. The unfortunate results include overboard installation of repeaters, network traffic performance issues, low linking of transceivers to repeaters requiring repeater re-location, and longer installation hours trying to achieve 100% coverage.

- **Maintenance agreements based on poorly executed submeter installation philosophy.** The goal of all submeter installs is to achieve 100% coverage at the time of property construction completion. All meet that goal. However, in a poorly executed submeter install, the long-term impact is a high-maintenance meter health recovery requirement that consumes resources and impacts client loyalty and perception of the installing company. This also impacts billing workflow and overhead. For clients that don't have a maintenance agreement in place, this translates to more unplanned costs associated with the submeter installation.

- **Poorly executed submeter installations due to many factors.** The primary reason for poor radio performance is the variance associated with radio signal reception. Transceivers and repeaters do require some form of RF analysis of a site before installing. This is important since RF analysis is rarely done by the Project Managers or by the technician installing the system. The result is 100% coverage at completion with gradual transceiver signal loss as the property ages. The goal of 100% radio coverage at inception then becomes a maintenance marathon to restore that coverage as radios drop off the grid. Multiply that by hundreds of properties with the same issue, and it scales into a huge operational overhead cost.

Lack of understanding radios and networking technologies. Let's face it: submeter installing companies do not hire radio engineers or RF analysts. Instead, there is reliance on the submeter equipment to compensate for the organization's lack of radio expertise. This leads back to the previous point that problems creep in when an install is poorly executed. Some companies do provide a low level of product training. Additionally, some companies actually have a high level of experience installing submeter solutions. But all still rely heavily on the products' embedded RF linking technologies to offset the lack of radio engineering knowledge.

So, what is the solution to all of these challenges? We all point to technology as the only possible answer to the ever-growing problem of maintaining 100% coverage in a demanding and unfriendly apartment environment.

LORA/LORAWAN
In addressing the unfriendliness of apartment buildings to wireless networks, we are now seeing emerging technologies, such as LORA/LORAWAN, that minimize and sometimes eliminate repeater requirements. As an emerging radio technology, LORA/LORAWAN does have a few issues.

Gateway throughput devices like LORAWAN gateways do not store local data but instead send the data reads directly to the receiving internet server. This is contrary to the mindset of years of submetering philosophy, which requires some form of local data storage. For some companies, the lack of local access to data is a deterrent to employing LORA solutions. Additionally, since most want local access to their AMR, the troubleshooting and diagnostics for these type of systems is still being worked out.

LORA systems will become part of the AMR landscape whether or not a company embraces it. The advantage that this technology brings into play is the diminished maintenance originally caused by poorly planned repeater infrastructure implementation and poorly trained installers.

LORA systems usher in a new era of submeter. As the data collecting moves even further into an internet IoT server platform, the ability to marry the data garnered from analytical or AI software becomes prevalent. Endpoint devices would evolve into common household or user-level purchases with companies focusing more on data analytics of the services and revenue offered by such applications.

INTERNET OF THINGS (IoT)
The current emphasis on the internet and IoT devices is slowly merging into submeter. Unfortunately, the submeter industry is years behind in improved technologies that provide a greater customer experience and increase revenue generation for RBCs and submeter installers. Most submeter companies are neither tech-savvy nor equipped with the infrastructure to sustain any different technology not already within their knowledge pool.

I am continuously amazed at the impact the IoT movement has on home systems and, to some extent, the newer-constructed apartment complexes. But nothing compares to the effort that the apartment industry is employing on smart building implementation. While the IoT does play a part in this type of solution, it is by far the least developed in available endpoint devices that can measure tenant lifestyle energy consumption. Endpoint measuring devices, such as whole apartment smart socket deployments, would accelerate the smart building concept by providing granular electric energy consumption data at the tenant's lifestyle level and provide energy usage profiling essential for future AI software implementation.

In a way, we currently have a propensity towards gadget technology through the various voice assistant technologies now widely used in homes. Google Echo or Amazon Alexa, both market-leading voice assistants, is the way to go with smart apartment technology integration. Whether voice assists become the wave of the future in submetering or not is simply a question of the submeter industry gaining a better understanding of consumer behavior.

Integrated IoT endpoints do require an infrastructure that employs water, gas and electric submeter measuring.

It also requires understanding building resource consumption in all three areas of consumer usage. The advantages of IoT are infrastructure deployments. With multiple devices throughout the building, eventually the need for repeaters will no longer be an issue. For example, Zigbee-based smart sockets that replace ordinary wall outlets can become repeaters themselves — thus channeling data reads and information to the core controller. In a large apartment complex, this type of internal electric grid and communication network allows for placement of multiple devices without the need for repeater infrastructure.

Additionally, an abundance of such devices, prolific throughout the building, can act as security monitors by tracking signal from Zigbee-based chips on ID cards. Finally, smart sockets act as the backbone smart grid within a building that can be used for determining consumer consumption profiles down to the individual rooms and individual appliances within a tenant household.

Currently, all my major appliances come with Wi-Fi capability. The issue then becomes not one of endpoint integration but of whole system security: How secure are wireless-based appliances? Would these appliances provide backdoor access to external malware injections? Smart apartment integrators will need to address this and many other issues associated with incorporating tenant dwellings within a whole system building integration. Most individuals are not security-conscious nor are they interested in managing their own secure solutions for wireless appliances. Consumers just want things to work without their personal involvement.

Creating a safe wireless environment requires security measures as part of whole building integration. Limiting external entities access to tenant-level wireless devices becomes paramount in convincing tenants and creating confidence in smart building implementation. This takes submetering performance beyond the normal meter reading and everyday meter health reporting.

Author Bill Melendez

What Will a Green Label on Your Resume Do for Your Career?

While many people know that buildings and companies can earn sustainability certifications, did you know that people can become green-stamped, as well?

According to the "2020 GreenBiz State of the Profession Report," the most commonly held credentials for sustainability professionals are GRI or Global Reporting Initiative (53%), LEED (45%), university-based programs (18%), and SASB or Sustainability Accounting Standards Board (17%). That said, in September 2020, five of the leading reporting groups (including GRI and SASB) issued a statement of intent to work together to create a comprehensive global corporate reporting system, which some hope will streamline the certifications options in the future.

Of these popular credentials, let's start with LEED as it is the only one specifically focused on real estate and buildings. According to the U.S. Green Building Council, LEED (Leadership in Energy and Environmental Design) is the most widely used green building rating system in the world. As the name suggests, LEED initially focused on the energy and environmental aspects of built spaces, but it has since expanded to include components such as water, waste and occupant health.

Buildings and other aspects of the built environment can earn LEED "certification," while people who work in this area can earn LEED "credentials."

- LEED offers a general Green Associate credential, as well as five specialties in their Accredited Professional (AP) designation.

- The LEED Green Associate exam measures general knowledge of green building practices and how to support others working on LEED projects.

- The LEED AP exams also measure knowledge about green building but probe deeper to test knowledge of a specific LEED rating system and details of the building certification process.

- Specializations include Operations + Maintenance (for existing buildings), Building Design + Construction (for new buildings), and three others more applicable to buildings outside of multifamily.

Building-focused beyond LEED

Other building-focused credentials for individuals include Certified Energy Manager and three others from Association of Energy Engineers, two from Green Globes, and one each from Living Future Institute and WELL Building Institute. Although GRESB and ENERGY STAR® are both popular building rating systems, they do not currently offer certification for individuals. However, both do offer extensive on-demand training courses or webinars.

For those with a background in engineering, Certified Energy Manager can be a natural choice as it offers many benefits. In some jurisdictions, "you are able to perform some of the mandated energy-audits," according to Dimitris Kapsis, Vice President at RealPage® and a Certified Energy Manager. "If your full-time job is to manage energy projects, to understand how your operations impact your energy use, or to work in HVAC and lighting retrofits, then this could be useful to pursue." But he cautions, "It is a highly technical credential." So, if doing calculations on load management and KHW and energy output makes your head spin, this one is not for you.

Legitimacy and knowledge

One of the reasons to pursue a green credential is gaining the legitimacy and accountability associated with a third-party certifying that you possess certain knowledge or skills. Sometimes holding a credential can unlock job opportunities that might otherwise be closed to you. "An industry recognition can increase the value of your services," according to Kapsis. You can expand your opportunities with certain credentials like the Certified Energy Manager, which is "accepted throughout the world because it is a well-recognized designation." He observes that in the eyes of some people, your work may have more weight.

Another benefit of earning a green credential is the knowledge that you gain in the process of preparing for the certification exam and/or process.

Personally, I believe having the knowledge of industry standards that came from my LEED Green Associate credential has made me more effective in my job. For example, when RealPage designed Peer Comparison reports to enable benchmarking properties based on water and energy use intensity, I was able to apply my knowledge of how various cost and usage drivers relate to one another.

Weighing the investment

With these great benefits, why wouldn't everyone pursue a green certification? While the upfront cost can be a factor, one of the main deterrents is the time investment. There is a major time commitment required to meet the prerequisites (in the case of CEM, years of experience in the field), learn the required material, prepare for the test, and take the exam. In the case of both LEED and CEM, there is often a week-long prep course, plus weeks of additional studying, followed by carving out a large portion of a day for the exam. But in my own experience, and given the growing fascination with corporate sustainability, many conclude that pursuing a certification is worth the investment.

Reporting standards

Some of the popular credentials mentioned at the top are focused on sustainable reporting standards, including GRI and SASB. The importance of and scrutiny on ESG reporting is expected to dramatically increase this decade as CFOs and corporate boards become formally required to disclose this information.

In March 2021, the U.S. Securities and Exchange Commission (SEC) has launched a "Climate and ESG Task Force" within its Enforcement Division. In July 2021, SEC Chair Gary Gensler asked agency staff to submit a proposal for mandatory climate risk disclosures for agency consideration by the end of 2021. In September 2021, Gensler re-affirmed the SEC's commitment to disseminating new ESG disclosure rules as part of his testimony before the Senate Committee on Banking, Housing, and Urban Affairs.

At press time, publicly traded firms were still bracing for the agency to launch the new reporting guidelines in 2022. Such reports may be required in an expanded Form 10-K and describe a company's direct and indirect carbon emissions, including those by suppliers and partners in its "value chain."

Hopefully these forthcoming regulations will create more consistency for U.S.-based public companies which could introduce more stability into the world economy — but it will also introduce additional reporting burdens for those that have been resisting involvement in climate change accountability. According to Bloomberg News in December 2021, "Only half of big public companies hire a third party to review their sustainability disclosures, and almost none choose an accounting firm to provide that scrutiny. That may change soon."

Author Kent McDonald

Designing Energy Management Solutions for Futuristic Apartment Buildings

An HVAC system with an AI or analytics-capable software platform can evaluate the outside temperature and humidity levels and use these measurements to regulate internal building air conditioning as well as determine temperature stress on the building.

A while back, I wrote an article on using external temperature measuring within a home (or apartment) to regulate how the internal HVAC system maintained cold/hot air flow within a building. Internal building temperatures and its structure makeup are always impacted by external environmental temperature changes and humidity. An HVAC system with an AI or analytics-capable software platform can evaluate the outside temperature and humidity levels and use these measurements to regulate internal building air conditioning as well as determine temperature stress on the building.

An enterprising student in Japan emailed me, saying that he used that concept from my paper to postulate a possible energy management solution for commercial buildings that minimized energy consumption. The idea is to track external temperature measurements as part of the internal temperature determination when heating or cooling individual rooms. With the information tracked, the AI software can judge which sides of the building or which rooms need heating or cooling based on direct sunlight.

By adding control dampers in all the rooms, the system can shut or open these dampers to circulate air — thus managing room temperature. As the sun changes positions relative to the building, the HVAC system can compensate by either reducing air flow and temperature or increasing it. So, rooms with direct sunlight would need less heat in winter or more cooling in summer. For the other rooms not in direct sunlight, the system can either turn off (closing all dampers) or reduce its HVAC air requirements.

Such an energy management approach does require more thought in building construction. It also assumes software with the capacity to evaluate both external and internal temperature and humidity. Humidity levels, of course, play a part in human comfort. Any HVAC solution designed to reduce energy requirements for HVAC temperature control would need to take this into account. This brings up an interesting endpoint requirement: temperature sensors. Potential sensors would include a window shade or glass that can reduce or increase heat or cold on its surface. As the temperature impacts the window, the sensor identifies a critical point and activates the shade or causes the glass to reflect or absorb more sunlight. For commercial buildings with glass walls, this can generate a great ROI in energy management and sustainability.

The entire process has one goal in mind — that of maintaining a constant temperature as defined by the tenant while minimizing the amount of energy needed to accomplish that. Energy consumption equates to overhead costs, so an equilibrium between tenant comfort and building management needs to be established. In an apartment complex, each tenant has different temperature and humidity requirements resulting in a complicated and tedious management of these two variables.

The use of AI software would alleviate the need for constant human interaction with the environmental controls and achieve tenant satisfaction at the individual level. The AI can do what a building manager can't do — continuously assessing environmental configurations at tenant levels and adjusting the HVAC system accordingly. Tenants can verbally ask the AI, whether via Alexa, Echo or any other voice assist solution, for an increase or decrease in temperature and humidity levels within set parameters defined by the apartment management.

In a closed environment, such as in apartment units, regulating humidity levels falls within the requirements of the HVAC system. Too much or too little humidity is a matter of regulating the air flow moisture into the apartment unit to maintain a balance. Not an easy task. However, it is doable with an AI solution and proper humidity sensor technology.

The current HVAC industry focuses on consumption and how to read this through various meters and thermostats. There is a lot of emphasis on smart buildings and smart technologies that provide some form of energy consumption tracking and monitoring. What is missing in the equation is the involvement of the energy consumers — the individuals who live and consume energy in a home, apartment or business office.

Engaging each consumer is a daunting task when considering that each individual uses energy based on their needs. Addressing the variance from one consumer to another requires a level of granularity unprecedented in today's world. Yes, we claim that buildings are getting smarter and, eventually, granularity of consumption habits will also be tracked and measured. The point is that the energy management industry must evolve past merely measuring energy consumption to that of managing individual consumer energy usage.

One of my earlier essays focused on a concept in electricity consumption using smart socket technology. The idea was that the smart sockets would track not just what is being consumed but also the habits associated with the consumption. Tracking consumption habits, or profiling, requires a 24/7 measuring and tracking solution that only comes from sensors that are directly involved in the day-to-day activities of individuals.

Proliferating sensors throughout a home or building may not be cost-effective. An alternative would be AC outlets that are really "smart-empowered" with abilities to monitor and gather data on how electricity is being used, which would be the basis of a consumption profile. If we add all other appliances to the mix, an in-depth profile of the individual's daily habits would emerge, and the AI energy management program can respond to minimize energy usage. Humans do certain things repetitively when they wake up in the morning. Whether in the bathroom, the kitchen, or any other location in a home, electronics usage defines a habit that can be profiled.

The idea of profiling would be a step forward in AI interaction with consumers at the location of consumption. It also moves Energy Management solutions away from merely measuring consumption towards making strategic decisions for the tenant that benefit all.

The thought of using an AI Energy Management solution in controlling environmental factors within a house, building or apartment unit is not farfetched. Today's smart energy is but a forerunner of things to come as energy becomes a necessary but limited commodity that includes water, gas and electricity. The industry must move beyond mere measurements and simple analytics towards an energy management solution that is interactive and consumer habit-oriented in its "smartness."

In an article on elder care, I featured an AI energy management solution for elderly individuals living at home. This type of deployment tracked all activities within a home or apartment that included water, gas, and electric consumption. These endpoints created a daily profile of an elderly person's daily activities. Should the daily routines change suddenly, an alarm message could be delivered to loved ones so that they can quickly respond to the situation.

Energy management in future systems must look beyond the mundane reading of meters and take on the task of cooperating with tenant lifestyle and consumption habits. Not only is this good ROI, but it also expands the services of energy management to include other "out-of-the-box" solutions that improve tenant security and trust.

Resource use — water, gas or electricity — will eventually outpace availability. The way we perceive Energy Management, or whatever replaces it, impacts the availability and conservation of future resources. In an era of global warming and carbon footprint concerns, every managed consumption indirectly affects these two global issues. How we plan now in managing consumption is key to overcoming these pressing challenges.

Author Bill Melendez

Metro Average Benchmark

Energy and Water

Climate Region: Mixed-Humid

Area Averages	5/1/2020 - 4/30/2021		Unit Count	Occupancy	SqFt per Unit	Energy $ / Unit	Water $ / Unit
Portfolio Metro Average:	Ball Partners	21 Properties in metro	275	87%	941	$9	$11
Metro Average:	Raleigh-Durham-Chapel Hill NC MSA		234	91%	944	$8	$8
National Average:			183	92%	1,044	$14	$13

Energy Cost Per Unit

12 Month Average	Portfolio	Metro	National
Effective Rate ($/kBtu)	0.0442	0.0408	0.0104
Cost Per Unit	$9	$8	$14
Consumption Per Unit (kBtu)	197	187	1,356

Water & Irrigation Cost Per Unit

12 Month Average	Portfolio	Metro	National
Effective Rate ($/Gal)	0.0064	0.0009	0.0035
Cost Per Unit	$11	$8	$13
Consumption Per Unit (Gal)	1,660	9,077	3,797

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